

Personal Cabin Pressure Monitor and Altitude Warning System

The National Aeronautics and Space Administration (NASA) seeks to transfer the NASA-developed Personal Cabin Pressure Monitor and Altitude Warning System to private industry for use in commercial applications. Developed at the John F. Kennedy Space Center (KSC), the device may help prevent aircraft accidents by warning the crew of potentially dangerous or deteriorating cabin pressure altitude conditions and reminding them of the need for supplemental oxygen. This personal, portable device can be used in a variety of aviation, aerospace, and nonaerospace applications where knowledge of one's exposure to low partial pressure of oxygen is important.



Potential Commercial Uses

- Pressurized aircraft
- Nonpressurized aircraft
- Human-tended space operations
- Ground-based aerospace systems (e.g., vacuum test chambers)
- Altitude chambers
- Environmental simulation vessels
- Meteorology
- Mountain climbing

Benefits

- Its small compact size (5" high x 2.5" wide x 1" depth) and low weight (<5 oz.) provide portability.
- The device serves as a backup monitoring system on pressurized aircraft and indicates when supplemental oxygen is needed on nonpressurized aircraft.
- The high-impact and water-resistant housing makes for a rugged device.
- The device is user-programmable for Federal Aviation Regulations (FAR) Parts 91, 121, and 135 operations.
- Temperature compensation ensures accurate readings over a wide temperature range.
- Simultaneous audio, vibratory, and visual alarms are easily detected.



The Technology

Hypoxia results from unprotected exposure above certain altitudes. Defined as an insufficient supply of oxygen to the body's tissues, hypoxia insidiously affects the central nervous system and organs. The most dangerous aspect of hypoxia is that the victim may lose the ability for critical judgement before detecting any impairment. Hypoxia is particularly dangerous for an aircraft crew when there is a slow, progressive increase in cabin altitude or a sudden exposure to high cabin altitude.

NASA Kennedy Space Center has developed a personal safety device that alerts the user of dangerous or deteriorating cabin pressure altitude conditions, based on the limits prescribed in the Federal Aviation Regulations (FAR). The device provides an alert when a programmed cabin pressure altitude is reached and an alarm if a second programmed cabin pressure altitude is reached, or after 30 minutes between the two altitudes.

This technology uses a calibrated, temperature-compensated, pressure transducer that functions independently from other aircraft systems. The end product serves as an important backup device for pressurized aircraft and is useful for time-at-altitude monitoring for nonpressurized aircraft. A standard unit is the size and weight of a personal pager. It contains a battery, the pressure transducer, a timer, alarms (auditory, vibratory, and visual), and a display that indicates the cabin pressure altitude and battery life.

Options for Commercialization

NASA seeks qualified companies to commercialize the Personal Cabin Pressure Monitor and Altitude Warning System. This and other technologies are made available by the KSC Technology Commercialization Office through a variety of licensing and partnering agreements. These include patent and copyright licenses, cooperative agreements, and reimbursable and nonreimbursable Space Act Agreements.

Contact

If your company is interested in the Personal Cabin Pressure Monitor and Altitude Warning System or if you desire additional information, please reference Case Number KSC-12168 and contact:

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Commercialization Checklist

- ✓ Patent pending
 - U.S. Patent
 - Copyrighted
- ✓ Available for licensing
 - Available for no-cost transfer
 - Seeking industry partner for further codevelopment

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